Office Action Summary	Application No.	Applicant(s)	
	10/516,327	PROCTOR ET AL.	
	Examiner	Art Unit	
	ANDREW LAI	2473	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 June 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *31 and 32* is/are allowed.

6)☒ Claim(s) *1-7,16-21,27-30,33 and 35* is/are rejected.

7)☒ Claim(s) *8-15,22-26,34 and 36* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. *10/28/2009* .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Examiner's Notes

In this Office Action, Atkinson (US 5,883,884) will be extensively discussed, especially figures 1 and 9 will be repeated referenced to. It is hereby advised that the following associations of elements in the two figures are established, and they are termed in this Office Action shown below:

Figure 1		Figure 9		Office Action
Base 100	↔	Base 920	↔	Base Station
Level 1 repeater 103	↔	Level 1 RPTR 921	↔	Repeater
Telephone 111	↔	Laptop computer 913	↔	Subscriber

Specification

1. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matters discussed below. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

Regarding claims 1, 22, 28, 33, 34 and 35, these claims claim a similar feature related to receiving two bi-directional transmission frequencies **simultaneously** as particularly highlighted below for each of said claims (noting that this feature was originally claimed):

Claim 1: … *receiving signals on said at least two bi-directional communication frequencies* ***simultaneously***…

Claim 22: … *to receive data from the base unit and the client unit on the first and second bi-directional communication links* ***simultaneously***.

Claim 28: … *receiving the wireless signals from the first and second wireless station devices on first and second bi-directional communication links* ***simultaneously***.

Claim 33: … *receiving the wireless signals from the first and second wireless station devices on the first and second bi-directional communication links* ***simultaneously***.

Claim 34: … *receiving signals on said at least two bi-directional communication frequencies* ***simultaneously***.

Claim 35: … *to receive signals on said at least two bi-directional communication frequencies* ***simultaneously*** …

However, Applicant's description in the Specification fails to provide proper antecedent basis. The only relevant description can be found in the first paragraph on page 7 of the originally filed Specification "... the wireless repeater 200 is capable of **simultaneously** receiving and transmitting signals as well as extending the coverage and performance of the wireless gateway 100 to the client device 105" (emphasis added by Examiner).

It is clear that the Specification provides simultaneously receiving and transmitting signals, which in Applicant's own words "simply indicates that the repeater can transmit and receive at the same time; not receive two communications on two different frequencies at the same time" (see Applicant's argument of 6/19/2009 against previously applied primary reference of Atkinson, US 5,883,884, regarding Atkinson's teaching of "repeaters are configured so that transmitter 701 and receiver 702 operate simultaneously", Atkinson col. 8 lines 26-28).

Claim 35 additionally claims "*A computer-readable medium…*", for which the Specification also failed to provide proper antecedent basis.

Claim Objections

2. Claims 1, 15, 16, 18, 22, 27, 28 and 33 are objected to because of the following informalities: "*capable of*" performing certain functionalities.

Regarding claims 1, 15, 16, 18, 22, 27, 28 and 33, it is noted that each of them has the phrase "*capable of*" followed by certain function or action step(s). For example, Claim 1 comprises "… *a receiver capable of receiving signals on said at least two bi-directional communication frequencies simultaneously ...* " (emphasis added). As such, the claim scope is

not limited by claim language "capable of", taken as being equivalent to "adapted to/for", that suggests or makes optional but does not require steps to be performed, see MPEP §2111.04. Also, it has been held that the recitation that an element is "capable of" performing a function is not positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. *In re Hutchison,* 69 USPQ 138. Therefore, the "*capable of*" phrase in said claims is deemed not to require positive/active steps to be performed. It is thus recommended that the "*capable of*" phrase in all above cited claims be changed to "*configured to*" or "*configured for*". Appropriate correction is required.

Regarding claim 36, it recites "… *in order to decode at the least two bi-directional communication frequencies simultaneously*" (emphasis added). It appears that the order of the words "*at the*" should be reversed so the claim reads "… *in order to decode the at least two bi-directional communication frequencies simultaneously.*" Appropriate correction is required.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Regarding claim 35, Claim 35 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 35 claims "*A computer-readable medium…*" Throughout the Specification, Examiner failed to find anywhere such subject matter is disclosed, much less the details thereof. It is therefore asserted that the claimed subject matter comprises transitory

medium such as a carrier wave or signal, which in turn is directed to a non-statutory subject matter and thus is rejected.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claim 35 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claim 35, this claim is not an originally filed claim but rather a newly added claim in response to the Office Action of 8/11/2008. Claim 35 recites "*A computer-readable medium…*" As stated in section 3 above, the description of the original Specification failed to disclose *a computer-readable medium*, much less the details thereof. Therefore, this claim introduced a new subject matter.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 16 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 16, this claim recites the limitation, among others, "*... a receiver capable of **simultaneously** receiving **a** signal on **either** of said first and said second bi-directional communication frequencies, ...*" (emphasis added).

Regarding claim 18, this claim recites the limitations, among others, "*... a receiver capable of receiving **a** signal on said at least first and second bi-directional communication frequencies **simultaneously**, ...*" (emphasis added).

It is unclear what the term *simultaneous* hereinabove refers to because the very term *simultaneously* necessarily implies an action/operation literally at the same time regarding multiple things in three scenarios: 1) performing at least two different tasks with respect to one object, 2) performing one task but with respect to at least two objects, or 3) the combination of 1) and 2). However, the claimed feature in both claims 16 and 18 does not belong to any of the three scenarios because it is claimed to be "*simultaneously*" doing one thing, i.e., *receiving*, with respect to one object, i.e., *a signal* which, in the case of claim 16, is on ***either*** of the two frequencies, and, in the case of claim 18, is unclear in that how "***a*** signal" can be on two frequencies at the same time.

In view of the contents of claims 16 and 18 in their entirety, claim 16 is interpreted as "... *capable of ~~simultaneously~~ receiving a signal on either of said first and said second bi-directional communication frequencies...*" and claim 18 is interpreted as "... *capable of receiving a signal on one of said at least first and second bi-directional communication frequencies ~~simultaneously~~ ...*". Subsequent Office Action regarding these two claims will be based on this interpretation.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1, 3, 6 and 18-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Atkinson (US 5,883,884, Atkinson hereinafter).

Atkinson discloses "a method and apparatus for attaining ... extended range in wireless digital communication systems" (col. 1 lines 7-9) employing a hierarchic network of repeaters (figs. 1 and 9 showing various repeaters at different levels with respect to the base station 100 or 901 thereof), comprising:

- **With respect to Independent claims 1 and 18**

Regarding claim 1, *An apparatus* (figs. 1 and 9 “level 1 repeater 103/921”, "repeater" hereinafter) *for facilitating wireless communication in a network* (above cited “wireless digital communication systems” as also depicted in figs. 1 and 9) *between a first communication device* ("base station", item 100/901 of figs. 1/9) *and a second communication device* ("subscriber", item 111/913 of figs. 1/9, noting that the *wireless communication between* said “subscriber” and “base station” are shown in figs. 1/9 to be

facilitated by said "repeater"), *said network* (again, figs. 1/9) *including at least two bi-directional communication frequencies* (fig. 9 showing *bidirectional frequency* "F1" between "base station 920" and "level 1 repeater 921" and *bidirectional frequency* "F2" between "level 1 repeater 921" and "laptop 913") *each using a time division duplex format of data transmission* (fig. 9, "OUTBOUND TDM" and "INBOUND TDMA" each having 8 time slots, which further "alternating between transmission and reception modes using time division duplex (TDD)", col. 4 lines 12-13), *comprising:*

a receiver (fig. 7 "receiver 702" in coupling with "antenna 704" shown also in fig. 1 on "repeater 103" responsible for receiving as well as retransmitting signals) *capable of receiving signals on said at least two bi-directional communication frequencies simultaneously* (fig. 9 showing "repeater 921", which should be understood to have the same "receiver 702/antenna 704" shown in fig. 7, which is capable of *receiving two bi-directional frequencies* simultaneously, even though it may process only one frequency at a time, because, see fig. 7 in view of the "level 1 repeater" of fig. 1, the repeater is in the range of talking to multiple terminal devices, other repeaters and base stations from which multiple frequencies are capable of reaching the repeater *simultaneously* and thus capable of being *received* by the antenna of the repeater *simultaneously* as well);

a signal detector (fig. 7 "microcontroller 703") *operatively coupled to the receiver* (fig. 7 showing "microcontroller 703" *operatively coupled to* "antenna 704/receriver 702") *for determining if a signal is present on at least one of said at least two bi-directional frequencies* ("Microcontroller 703 monitors signal quality and controls synthesizers 705, 706 to set the transmission and reception frequencies", col. 8 lines 28-30, noting that by

"monitors signal quality" for the "transmission and reception frequencies", the "microcontroller 703" will have to first *determine if a signal is present on at least one of said at least two frequencies*); *and*

a frequency converter (fig. 7 "synthesizer 705" associated with "transmitter 701") *for converting the signal present on one of said bi-directional frequencies to a converted signal on the other of said bi-directional frequencies* (fig. 9 showing "repeater 921" *converting the signals*, in the downlink direction, from "F1" from "base station 920" to "F2" to "laptop 913", and in the uplink direction, from "F2" from "laptop 913" to "F1" to "base station 920"; therefore, "repeater 921" must have internally *a frequency converter* to perform the depicted *bi-directional* "F1" ↔ "F2" *frequency* conversion, which *converter* obviously comprised of "synthesizer 705" because "synthesizer 705, 706 to set the transmission and reception frequencies", col. 8 lines 29-30, wherein "synthesizer 705" must be responsible for "setting the transmission frequency", which in the downlink would be getting "F1" and *converting to* "F2" and the opposite for uplink);

a transmitter (fig. 7 "transmitter 701" in coupling with "antenna 704" shown also in fig. 1 on "repeater 103" responsible for transmitting as well as receiving signals) *for transmitting the converted signal on the other of said bi-directional frequencies* (fig. 9 showing "repeater 921" *transmitting the converted signal on* "F2/F1" for downlink/uplink as *the other of said bi-directional frequencies* than the originally received "F1/F2" frequencies).

Regarding claim 3, *the apparatus of claim 1, wherein said signal detector* (fig. 7 "micro-controller 703") *is for detecting the signal at a radio frequency* ("Microcontroller

703 monitors signal quality and controls synthesizers 705, 706 to set the transmission and reception frequencies", col. 8 lines 28-30);

Regarding claim 6, *the apparatus of claim 1, wherein said receiver and said transmitter* (fig. 7 "receiver/transmitter 702/701") *share a single antenna* (fig. 7 "antenna 704) *that is connected to said receiver and said transmitter through an isolator* (fig. 7 showing "antenna 704" *connected to* "receiver 702" and "transmitter 701" *though* "duplexer 707" which is "to isolate receiver input signals from transmitter output signals", col. 8 lines 31-32).

Regarding claim 18, *a repeater* (figs. 1/9 "level 1 repeater 103/921" of which a detailed view is shown in fig. 7) *for a network* (figs. 1/9) *including at least first and second bi-directional communication frequencies* (fig. 9 showing *first/second frequencies* "F1/F2" with "F1" being *bi-directional* between "base station 920" and "repeater 921" and "F2" *bi-directional* between "repeater 921" and "laptop 913"), *comprising:*

a receiver (fig. 7 "receiver 702") *capable of receiving a signal on* <u>*one of*</u> *said at least first and second bi-directional communication frequencies* ~~*simultaneously*~~ (see section 6 above for the ground of adding "*one of*" and striking out "*simultaneous*") (above cited "F1/F2" *frequencies* and see fig. 9 for a showing of "repeater 921", which should be understood to have the same "receiver 702/antenna 704" shown in fig. 7, receiving "F1" from "base 920" and receiving "F2" from laptop 913);

a transmitter (fig. 1 "transmitter 701") *for transmitting the received signal on said at least first and second bi-directional communication frequencies* (fig. 9 showing

"repeater 921", comprising said "transmitter 701", *transmitting the received signal*, in the downlink direction, of "F1" frequency from "base station 920" as at "F2" frequency to "laptop 913" and vice versa in the uplink direction); *and*

an antenna (fig. 7 "antenna 704") *operationally connected to said receiver and sad transmitter* (fig. 7 showing "antenna 704" *operationally connected to* "receiver 702" and "transmitter 701"), *wherein said transmitter and said receiver operate on different frequencies* (fig. 1 showing "repeater 921" receiving, in downlink/uplink direction, "F1/F2" frequency, but transmitting "F2/F1" frequencies, meaning the *transmitter and receiver* thereof must *operate on different frequencies* in either direction, i.e., downlink receiver/F1 → transmitter/F2 and uplink receiver/F2 → transmitter/F1) *and use a time division duplex protocol* (fig. 9, "OUTBOUND TDM" and "INBOUND TDMA" each having 8 time slots, which further "alternating between transmission and reception modes using time division duplex (TDD)", col. 4 lines 12-13).

Regarding claim 19, *the repeater of claim 18, further including a circulator* (fig. 7 "micro-controller 703") *for receiving a signal information packet on said receiver* (fig. 7 dashed bi-directional arrow between "micro-controller 703" and "receiver 702/synthesizer 706" denoting *receiving signal information on* "receiver 702") *on said first bi-directional communication frequency* (fig. 9, e.g., "F1/F2" for downlink/uplink between "base station 920" and "laptop 913") *and for transmitting the signal information packet using said transmitter* (fig. 7 dashed bi-directional arrow between "micro-controller 703" and "transmitter 701/synthesizer 705" denoting *transmitting signal information packet* to "transmitter 701") *on said second bi-directional communication*

frequency (fig. 9, e.g., "F2/F1" for downlink/uplink between "base station 920" and "laptop 913").

Regarding claim 20, *the repeater of claim 19, wherein said receiver includes a signal detector operatively coupled to the circulator* ("micro-controller 703", which itself acts as *a signal detector* because "microcontroller 703 monitors signal quality and controls synthesizers 705, 706 to set the transmission and reception frequencies", col. 8 lines 28-30) *that determines if the signal is present on one of said at least first and second bi-directional communication frequencies* (since "microcontroller 703 monitors signal quality" of either "F1" or "F2" *frequency*, it must first *determine if the signal is present*), *and a frequency converter* (fig. 7 "synthesizer 705" associated with "transmitter 701") *operatively coupled to the receiver* (fig. 7 depicting "synthesizer 705" *coupled to* "receiver 702" via "level number increment 708" module) *for converting the signal present on one of said at least first and second bi-directional communication frequencies to the other of said at least first and second bi-directional communication frequencies* (refer to fig. 7 and note therein "receiver 702" sending received signal at, e.g. "F1", to "synthesizer 705", which "synthesizer 705", under the control of "micro-controller 703", is "to set the transmission frequency", col. 8 lines 29-30, at, e.g., "F2", for which process fig. 9 shows an overall picture, wherein, for downlink direction, "F1" enters "repeater 921" from "base station 920" and "F2" exits "repeater 921" to "laptop 913", and the opposite for the uplink direction).

10. Claim 33 is rejected under 35 U.S.C. 102(e) as being anticipated by Leslie et al (US 6,404,775, Leslie hereinafter).

Leslie discloses “band-changing repeater with protocol or format conversion” (Title) comprising the following features:

Regarding claim 33, *a wireless coverage extension device* (figs. 1 and 3, “upbanding repeater 110”) *capable of receiving and transmitting wireless signals* (fig. 1 denoting *wireless signals* between “cellular system 112” and the “repeater” and between “PCS system 142” and the "repeater") *from/to* (fig. 1 signals “122/120”) *a first wireless station device* (fig. 1 "cellular base station 114" in the “cellular system 112”) *on a first bi-directional communication link* (fig. 1 air interface between “cellular base station 114” and the “repeater”, “cellular link” hereinafter) *and to/from* (fig. 1 signals “126/124”) *a second wireless station device* (fig. 1 “subscriber 118” in the “PCS system 142”) *on a second bi-directional communication link* (fig. 1 air interface between the "repeater" and "subscriber 118", “PCS link” hereinafter), *allowing the first and second wireless station devices to communicate* (fig. 1 showing the "repeater" bridging or *allowing* the communication between the "cellular base station" of the "cellular system 112" and the “subscriber 118” of the “PCS system 142”), *the first bi-directional communication link* (“cellular link”) *operating on a first frequency channel* (fig. 1 “800 MHs" for the “cellular link”) *utilizing a first directional antenna* (fig. 1 “antenna 128”, for which “as is known in the art, … separate directional antennas may be used to divide the area covered”, col. 10 lines 11-13), *and the second bi-directional communication link* ("PCS link") *operating on a second frequency channel* (fig. 1 "1.9 GHz" frequency for the “PCS link”) *utilizing a second directional antenna* (fig. 1 “antenna 140”, for which, again, “as is known in the art, … separate directional antennas may be used to divide the area covered”, col. 10

lines 11-13), *the wireless coverage extension device* (again figs. 1 and 3) *further capable of receiving the wireless signals from the first and second wireless station devices* (fig. 1 "base station 114" and "subscriber 118") *on the first and second bi-directional communication links* (fig. 1 "800 MHz" and "1.9 GHz") *simultaneously* (Leslie's repeater shown in fig. 1 is *capable of receiving* the "800 MHz" and "1.9 GHz" *links simultaneously*, even though it may process one frequency at a time, because, see fig. 1, the repeater is in the range of talking to multiple terminal devices and base stations from which multiple frequencies are capable of reaching the repeater *simultaneously* and thus capable of being *received* by the antenna of the repeater *simultaneously* as well).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 2, 4, 7 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Atkinson in view of Leslie.

Atkinson discloses claimed limitations in section 9 above as applied to claims 1 and 19, and further:

Regarding claim 2, Atkinson discloses *the apparatus of claim 1, wherein said signal detector* (fig. 7 “micro-controller 703”) *operates at a* radio *frequency* (see discussion for claim 3 in section 2 above).

Atkinson does not expressly disclose the signal detector operates at *an intermediate frequency* (IF). However, detecting signal strength at *intermediate frequency* (IF) using *a power detector* has been a well known technique in the art at the time of instant invention. Leslie, in disclosing “band-changing repeater with protocol or format conversion” (Title), provides one such example comprising signal detector (fig. 5 “RSSI detector 342”, which fig. 5 shows some details of fig. 3's “IF filter and gain control block 166”, col. 10 lines 56-57, which fig. 3 in turn shows some details of the "upbanding repeater 110" of fig. 1) operates at *an intermediate frequency* (IF) (see "The RSSI detector 342 uses the IF signal to derive an indication of the signal strength of the received signal”, col. 11 lines 15-17).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Atkinson by adding Leslie’s RSSI detector at an IF in order to provide clearer and better quality for signal repeating for "enabling transparent communication between component of the cellular and PCS system" (Leslie, col. 4 lines 26-28).

Regarding claim 4, Atkinson discloses *the apparatus of claim 1, wherein said receiver* (fig. 7 “receiver 702”) *is for receiving the signals on said at least two bi-directional frequencies simultaneously over a first antenna* (fig. 7 “receiver 702" coupled

to "antenna 704" for *receiving signals simultaneously at*, for example, "F1" and "F2" from "base station 920" and "laptop 913", respectively), *and*

said transmitter (fig. 7 "transmitter 701") *is for transmitting the converted signal* (fig. 9 showing *transmitting* "F1/F2" → "F2/F1" *converted signal* to "laptop 913/base station 920" in the downlink/uplink direction, respectively) *over a* same *antenna* (fig. 7 showing "transmitter 701" coupled to the same "antenna 704" that "receiver 702" coupled to for said *transmitting*).

Atkinson does not expressly disclose the transmitter transmitting signal over a *second* antenna. However, transmitting using a *second* antenna (different than the receiving antenna) has been a well known technique in the art at the time of instant invention. Leslie provides one such example comprising transmitter transmitting signal (fig. 3 "linear PA 174" and "1.9 GHz antenna coupler 132" transmitting received signal from receiving antenna 128 via "800 MHz antenna coupler 130") over a *second* antenna (fig. 3 antenna 140 coupled to said "1.9 GHz antenna coupler 132" for signal to be sent to "PCS system 142" comprising "1.9 GHz subscribers 118").

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Atkinson by adding Leslie's separate transmitting antenna in order to provide clearer and better quality for signal repeating for "enabling transparent communication between component of the cellular and PCS system" (Leslie, col. 4 lines 26-28).

Regarding claim 7, Atkinson does not expressly disclose *the apparatus of claim 1, wherein said receiver includes first and second single frequency channel receivers,*

where the first single frequency channel receiver and a transmitter for a first frequency share a first directionally isolated antenna, and the second single frequency channel receiver and a transmitter for the second frequency channel share a second directionally isolated antenna.

However, such features have been well known in the art at the time of the instant invention. Leslie provides one such example comprising *said receiver includes first and second single frequency channel receivers* (fig. 3, amplifier 154 as *first single frequency channel receiver* receiving cellular frequency from “800 MHz antenna coupler 130”, and amplifier 304 as *second single frequency channel receiver* receiving PCS frequency from “1.9 GHz antenna coupler 132”), *where the first frequency channel receiver* ("amplifier 154”) *and a transmitter* (fig. 3 “linear PA [power amplifier – Examine notes] 174") *for a first frequency channel* (fig. 3, the top cellular→PCS path denoted by reference numbers 178–176) *share a first directional isolated antenna* (fig. 3 transmitting antenna 140 for said cellular→PCS path, for which antenna 140, "directional antennas may be used", col. 10 lines 13-14), *and the second frequency channel receiver* ("amplifier 304") *and a transmitter* (fig. 3 “linear PA 324”) *for the second frequency channel* (fig. 3, the bottom PCS→cellular path denoted by reference numbers 198 – 328) *share a second directionally isolated antenna* (fig. 3 transmitting antenna 128 for said PCS→cellular path, for which antenna 128, "directional antennas may be used", col. 10 lines 13-14).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Atkinson by adding Leslie’s separate and isolated

receiving/transmitting antennas in order to provide clearer and better quality for signal repeating for "enabling transparent communication between component of the cellular and PCS system" (Leslie, col. 4 lines 26-28).

Regarding claim 21, Atkinson discloses *the repeater of claim 19, wherein said detector* (fig. 7 “micro-controller 703") *includes a* signal quality *indicator that detects the signal received at said receiver on one of said at least first and second bi-directional communication frequencies* (“F1” or "F2” of fig. 9, depending on downlink or uplink direction, and see “microcontroller 703 monitors signal quality”, col. 8 lines 28-29).

Atkinson does not but Leslie does expressly disclose said “micro-controller 703" includes *a power indicator* that detects the signal received (see discussion above for claim 2 regarding “RSSI detector 342” for received signal strength or power indication, applying also to claim 21).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Atkinson by adding Leslie’s RSSI detector in order to achieve the same goal as that stated for claim 2 above.

13. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Atkinson in view of Leslie, as applied to claim 4 above, and further in view of Judd et al (US 2002/0177401. Judd hereinafter).

Atkinson in view of Leslie discloses claimed limitations in section 12 above. And further:

Regarding claim 5, Leslie discloses *the apparatus of claim 4,* comprising *said first and second antennas* (Leslie fig. 1 antenna 128 and antenna 140 for "cellular system 112" and "PCS system 142", respectively).

Atkinson in view of Leslie does not expressly disclose said first and second antennas *have respective polarization that are largely orthogonal to one another.* However, using *orthogonally polarized* antennas in a repeater has been a well known technique at the time of instant application. Below is just one example of many.

Judd discloses "a repeater for use in connection with enhanced reception of wireless communications in an architectural structure utilizes a housing" (Abstract lines 1-3) using a "null antenna and a donor antenna" (Abstract lines 7-8) comprising first and second antennas *have respective polarization that are largely orthogonal to one another* (refer to fig. 1 and see "the donor antenna 12 and null antenna 14 are orthogonally polarized, e.g., vertical polarization for the donor antenna 12 and horizontal polarization for the null antenna 14", [0026] lines 5-7).

It would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the repeater of Leslie by adding the expressly taught orthogonally polarized antennas of Judd in order to provide high-quality radio communication "desirable to obtain clear signals within the home or residence" (Judd, [0003] last two lines).

14. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Atkinson in view of Milam (US 5,794,145, Milam hereinafter).

Atkinson discloses “a method and apparatus for attaining ... extended range in wireless digital communication systems" (col. 1 lines 7-9) employing a hierarchic network of repeaters (figs. 1 and 9 showing various repeaters at different levels with respect to the base station 100 or 901 thereof), comprising:

Regarding claim 16, *a wireless local area network* (figs. 1 and 9 showing *wireless local area network* with "base station", "repeaters" and various "subscriber/mobile" devices) *including at least first and second bi-directional communication frequencies* (fig. 9 showing *at least first and second bi-directional frequencies* comprising "F1" between "base station 920" and "repeater 921" and "F2" between "repeater 921" and "laptop 913"), *comprising:*

a first communication device (fig. 1 “base station 920”) *capable of transmitting and receiving data on said first bi-directional communication frequency* ("F1" shown in fig. 9 being used by "base station 920" for *bi-directional communication* with “repeater 921”), *wherein said first communication device transmits and receives data using a time division duplex format* (fig. 9, “OUTBOUND TDM” and “INBOUND TDMA” each having 8 time slots, which further “alternating between transmission and reception modes using time division duplex (TDD)”, col. 4 lines 12-13) *on either of said at least first or second bi-directional communication frequencies* (again fig. 9 showing “F1” being used by “base station 920” to *transmit/receive data* to/from “repeater 921”. It should be noted that choosing “F1” for “base station 920” is obviously only a design choice/convenience, which can obviously replaced by “F2” instead, as well known in the art, which means that “base station 920” is obviously *capable of transmitting and receiving data on* "F1"

and "F2" and using either “F1” or "F2” does not have advantages/disadvantages over the other. However, since Atkinson does not appear to have expressly taught about this, it will be further discussed below in view of Milam),

a second communication device (fig. 9 “laptop 913”) *capable of transmitting and receiving data on said second bi-directional communication frequency* ("F2" shown in fig. 9 being used by "laptop 913" for *bi-directional communication* with “repeater 921”), *wherein said second communication device transmits and receives data using a time division duplex format* (fig. 9, “OUTBOUND TDM” and “INBOUND TDMA” each having 8 time slots, which further “alternating between transmission and reception modes using time division duplex (TDD)”, col. 4 lines 12-13) *on either of said at least first or second bi-directional communication frequencies* (again fig. 9 showing “F2” being used by “laptop 913” to *transmit/receive data* to/from “repeater 921”. It should be noted that choosing “F2” for “laptop 913” is obviously only design choice/convenience, which can obviously replaced by “F1” instead, as well known in the art, which means that “laptop 913” is obviously *capable of transmitting and receiving data on* "F2" and "F1" and using either “F2” or "F1” does not have advantages/disadvantages over the other. However, since Atkinson does not appear to have expressly taught about this, it will be further discussed below in view of Milam),

a repeater (figs. 1/9 "repeater 103/921" of which fig. 7 has a detailed view) *for improving a communication link between said first and said second communication devices* (see fig. 1, in view of fig. 9, pictorially showing "repeater 103" *improves communication link between* “base station 100”, equivalent to "base station 920" of fig.

9, and “phone 111”, equivalent to “laptop 913” of fig. 9, in that they would not be able to communicate with each other without "repeater 103" because "phone 111" is outside the coverage area 115 of "base station 100"), *said repeater* (fig. 7) *including a receiver* (fig. 7 “receiver 702” in coupling with “antenna 704” shown also in fig. 1 on "repeater 103" responsible for receiving as well as retransmitting signals) *capable of* ~~*simultaneously*~~ (see discussion in section 6 above for the ground of striking out “*simultaneously*”) in *receiving a signal on said at least two bi-directional communication frequencies* (fig. 9 showing "repeater 921”, which should be understood to have the same "receiver 702/antenna 704" shown in fig. 7, *receiving signals* from "base station 920"/"laptop 913” at *frequencies* "F1/F2"), *a signal detector* (fig. 7 “microcontroller 703”) *operatively coupled to the receiver* (fig. 7 showing “microcontroller 703” *operatively coupled to* “antenna 704/receriver 702”) *that determines if a signal is present on at least one of said at least two bi-directional frequencies* (“Microcontroller 703 monitors signal quality and controls synthesizers 705, 706 to set the transmission and reception frequencies”, col. 8 lines 28-30, noting that by “monitors signal quality” for the “transmission and reception frequencies”, the "microcontroller 703” will have to first *determine if a signal is present on at least one of said at least two frequencies*), *a frequency converter* (fig. 7 “synthesizer 705” associated with “transmitter 701”) *operatively coupled to the signal detector for converting the signal present on the one of said bi-directional frequencies to a converted signal on the other of said bi-directional frequencies* (fig. 9 showing “repeater 921” *converting the signals*, in the downlink direction, from “F1” from “base station 920” to “F2” to “laptop 913”, and in the uplink

direction, from “F2” from “laptop 913” to “F1” to “base station 920”; therefore, “repeater 921” must have internally *a frequency converter coupled to the* “micro-controller 503” to perform the depicted *bi-directional* “F1” ↔ “F2” *frequency* conversion, which *converter* obviously comprised of "synthesizer 705" because "synthesizer 705, 706 to set the transmission and reception frequencies”, col. 8 lines 29-30, wherein “synthesizer 705” must be responsible for “setting the transmission frequency”, which in the downlink would be getting "F1" and *converting to* "F2" and the opposite for uplink, and as shown in fig. 7, said “synthesizer 705" is *operatively coupled to the signal detector* “micro-controller 703” which “monitors signal quality” for the “transmission and reception frequencies” as said above), *and a transmitter* (fig. 7 “transmitter 701” in coupling with “antenna 704” shown also in fig. 1 on "repeater 103" responsible for transmitting as well as receiving signals) *that transmits the converted signal on the other of said bi-directional frequencies* (fig. 9 showing “repeater 921” *transmitting the converted signal on* "F2/F1" for downlink/uplink as *the other of said bi-directional frequencies* than the originally received “F1/F2” frequencies).

It is noted that while disclosing, regarding claim 16, the “base station” and the "laptop” using a *bi-directional frequency*, i.e., “F1” for "base station" and "F2" for "laptop", Atkinson does not expressly disclose that said “base station" and “laptop”, collectively denoted herein as “wireless device”, capable of using said first *and second* bi-directional frequencies. However, as repeatedly discussed above, for each of the “base station” or “laptop” to use “F1” or “F2” is merely a design choice/preference and using either would have no advantage/disadvantage over the other, as obvious and well

known to one skilled in the art. In fact, for a "wireless device" to both a *first and second frequencies*, or simply multiple frequencies, has been a notoriously old and well known technique in the art. Below is just one example of many.

Milam discloses a "mobile device multiband antenna system" (Title) used for "mobile terminals" and "base stations" (fig. 1), comprising communicating using *first and second frequencies* (refer to fig. 1 and see "The cellular communication system 50 also includes one or more mobile terminals", col. 5 lines 31-32, wherein "only a single antenna 68 is needed to handle multi-band communication", col. 5, lines 45-47).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Atkinson by adding the explicitly taught "multi-band" antenna system of Milam to Atkinson's "wireless devices" in order to provide more cost effective system "which utilizes a single antenna to service two or more radios so as to reduce the size, weight and cost of the mobile device" (Milam, col. 3 lines 14-16).

Regarding claim 17, Atkinson discloses *the wireless local area network of claim 16, wherein at least one of said first or said second communication devices* (fig. 1 "base station 100" which is the same as fig. 9 "base station 920") *is connected to a wired network* (fig. 1 showing "base station 100" *connected to* "common equipment" network via "wire 120").

15. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Leslie in view of Jacobson (US 3,363,250, Jacobson hereinafter).

Regarding claim 27, Leslie discloses "band-changing repeater with protocol or format conversion" (Title) comprising the following features:

A wireless coverage extension device (fig. 1 "upbanding repeater 110" for *coverage extension* from "cellular system 112" to "PCS system 142", which “upbanding repeater 110” is also shown in fig. 3 with more details with further details shown in fig. 5 for fig. 3’s “IF filter and gain control block 166”, col. 10 lines 56-57) *capable of receiving and transmitting wireless signals* (fig. 1 denoting *wireless signals* between “cellular system 112” and the “repeater” and between “PCS system 142” and the "repeater”) *from/to* (fig. 1 signals “122/120”) *a first wireless station device* (fig. 1 "cellular base station 114" in the “cellular system 112”) *on a first bi-directional communication link* (fig. 1 air interface between “cellular base station 114” and the “repeater”, “cellular link” hereinafter) *and to/from* (fig. 1 signals “126/124”) *a second wireless station device* (fig. 1 “subscriber 118” in the “PCS system 142”) *on a second bi-directional communication link* (fig. 1 air interface between the "repeater" and "subscriber 118", “PCS link” hereinafter), *allowing the first and second wireless station devices to communicate* (fig. 1 showing the "repeater" bridging or *allowing* the communication between the "cellular base station" of the "cellular system 112" and the “subscriber 118” of the “PCS system 142”), *the wireless coverage extension device* (again “upbanding repeater 110”) *including an indicator* (fig. 5 “received signal strength indicator (RSSI) detector 342”, col. 11 lines 14-15) *for providing indication when received signal levels* (“RSSI” cited above) *from at least one of the station devices* (fig. 1 “cellular base station 114”) *are sufficient for communication between at least one of the first and second wireless station devices and the wireless coverage extension device* (“upbanding repeater 110”, and see “transmission by forward signal path … may be controlled by detecting whether a carrier

is present on the channel at a level which exceeds a predetermined threshold that corresponds to the minimum signal strength expected from the donor cellular base station 114", col. 13 lines 59-64, noting it is said "RSSI detector 342" that provides a measure of said "signal strength" and said "threshold" that provides *when received signal levels are sufficient for communication between* "cellular base station 114" and "upbanding repeater 110").

It is noted that, when disclosing, regarding claim 27, *providing* RSSI *indication*, Leslie does not expressly disclose providing *visual* indication. However, providing a *visual* indication for received signal strength has been a notoriously old and well known technique in the art at the time of instant invention. Below is just one example of many dating back to the year of 1968).

Jacobson discloses "a radio receiver [that] operates in conjunction with a radio transmitter to control various functions in response to signals received from the transmitter" (col. 1 lines 11-13) comprising providing *visual* indication when received signal levels are sufficient ("The device of this invention overcomes the shortcomings of prior art control devices in providing means for generating a positive visual indication of the level of signals in the receiver control channel", col. 1 lines 56-59).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the repeater of Leslie by adding the expressly taught "visual indication" of Jacobson for "the level of signals" in order to provide more user friendly monitoring mechanism which, "while completely reliable and accurate in its indicating

capability, is relatively simple and economical in its configuration" (Jacobson, col. 2 lines 9-11).

16. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Leslie in view of Judd.

Leslie discloses "band-changing repeater with protocol or format conversion" (Title) comprising the following features:

Regarding claim 28, *a wireless coverage extension device* (fig. 1 "upbanding repeater 110" for *coverage extension* from "cellular system 112" to "PCS system 142") *capable of receiving and transmitting wireless signals* (fig. 1 denoting *wireless signals* between "cellular system 112" and the "repeater" and between "PCS system 142" and the "repeater") *from/to* (fig. 1 signals "122/120") *a first wireless station device* (fig. 1 "cellular base station 114" in the "cellular system 112") *on a first bi-directional communication link* (fig. 1 air interface between "cellular base station 114" and the "repeater", "cellular link" hereinafter) *and to/from* (fig. 1 signals "126/124") *a second wireless station device* (fig. 1 "subscriber 118" in the "PCS system 142") *on a second bi-directional communication link* (fig. 1 air interface between the "repeater" and "subscriber 118", "PCS link" hereinafter), *allowing the first and second wireless station devices to communicate* (fig. 1 showing the "repeater" bridging or *allowing* the communication between the "cellular base station" of the "cellular system 112" and the "subscriber 118" of the "PCS system 142"), *the first bi-directional communication link* ("cellular link") *operating on a first frequency channel* (fig. 1 "800 MHs" for the "cellular link") *utilizing a first directional antenna* (fig. 1 "antenna 128" shown to be

communicating only in the *direction* towards the “800 MHz cellular base station 114"), *and the second bi-directional communication link* ("PCS link") *operating on a second frequency channel* (fig. 1 "1.9 GHz" frequency for the “PCS link”) *utilizing a second directional antenna* (fig. 1 “antenna 140” shown to be communicating only in the *direction* towards “1.9 GHz subscriber 118”), *the wireless coverage extension device* (again figs. 1 and 3) *further capable of receiving the wireless signals from the first and second wireless station devices* (fig. 1 “base station 114” and “subscriber 118”) *on the first and second bi-directional communication links* (fig. 1 “800 MHz” and “1.9 GHz”) *simultaneously* (Leslie’s repeater shown in fig. 1 is *capable of receiving* the “800 MHz” and “1.9 GHz” *links simultaneously*, even though it may process one frequency at a time, because, see fig. 1, the repeater is in the range of talking to multiple terminal devices and base stations from which multiple frequencies are capable of reaching the repeater *simultaneously* and thus capable of being *received* by the antenna of the repeater *simultaneously* as well).

It is noted that when disclosing *a first/send antenna*, Leslie does not expressly disclose, regarding claim 28, that the first antenna *of a specific polarization* and the second antenna *with a polarization orthogonal to* the first antenna. However, using orthogonally polarized antennas in a wireless repeater has been a well known technique in the art at the time of instant invention. Below is just one example of many.

Judd discloses “a repeater for use in connection with enhanced reception of wireless communications in an architectural structure utilizes a housing” (Abstract lines 1-3) using a “null antenna and a donor antenna" (Abstract lines 7-8) comprising first

antenna *of a specific polarization* and second antenna *with a polarization orthogonal to* the first antenna (refer to fig. 1 and see "the donor antenna 12 and null antenna 14 are orthogonally polarized, e.g., vertical polarization for the donor antenna 12 and horizontal polarization for the null antenna 14", [0026] lines 5-7).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the repeater of Leslie by adding the expressly taught orthogonally polarized antennas of Judd in order to provide high-quality radio communication "desirable to obtain clear signals within the home or residence" (Judd, [0003] last two lines).

17. Claims 29 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leslie in view of Judd, as applied to claim 28 above, and further in view of Lau et al (US 6,690,657, Lau hereinafter).

Leslie in view of Judd discloses claimed limitations in section 16 above. And further:

Regarding claim 29, Leslie in view of Judd discloses *the wireless coverage extension device of claim 28, wherein the first and second bi-directional communication links* (fig. 1 air interfaces for "cellular system 112" and for "PCS system 142") *utilize* cellular/PCS *protocol or a derivative thereof* (fig. 1 "CELLULAR"/"PCS" protocol).

Leslie in view of Judd does not expressly teach utilizeing also *802.11* protocol, in place "cellular/PCS". However, using *802.11* protocol for a LAN repeater has been well known in the art at the time of the instant invention. Lau, in disclosing "a multichannel distributed wireless repeater network" (Abstract line 1), provides one example,

comprising *utilize 802.11 protocol or a derivative thereof* (“a distributed wireless local area network can be designed to overcome problems inherent in the prior art designs”, col. 3 lines 61-62, which “prior art designs”, as Lau stated, includes "the IEEE 802.11 format", col. 2 line 25, therefore, Lau's system, as designed to “overcome problems inherent in the prior art designs” must consider IEEE 802.11 and be able to *utilize 802.11 protocol or a derivative thereof*).

It would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the system of Leslie by incorporating Lau's 802.11 protocol in order to provide a more widely applicable repeater wherein "robust, high-speed operation is best achieved with strong, direct-path signals, which maximize network flexibility and can best overcome interference" (Lau, col. 4 lines 3-5).

Regarding claim 30, Leslie in view of Judd *the wireless coverage extension device of claim 29, further comprising a demodulator for digital demodulating the detected signal during re-transmission thereof* (fig. 1 “demod[ulating] and gating control 138” for *demodulating* and gating *the detected signal during retransmission* for both “forward” and “reverse” “frequency translation” shown thereof).

Allowable Subject Matter

18. Claims 8-15 and 36 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claims 8-15, previous Office Action provided reasons for allowable subject matters in claims 8-15, said reasons are maintained herein.

Regarding claim 36, it uniquely identified the following underlined feature that conventional techniques in the art failed to anticipate or render obvious:

… the receiver splits a received signal into at least two split signals and processes the at least two split signals differently in order to decode the at least two bi-directional communication frequencies simultaneously

19. Claims 22-26 and 34 are objected to as containing the subject matter the Specification failed to provide proper antecedent basis for as discussed in section 1 above, but would be allowable if said antecedent basis is appropriately provided.

Claim 22 directs to a network operating on at least two bi-directional communication frequencies with a repeater capable of communicating between a base and a client unit. This claim uniquely identified the following underlined feature that conventional techniques in the art failed to anticipate or render obvious:

… the repeater further configured to receive data from the base unit and the client unit on the first and second bi-directional communication links ***simultaneously***.

Claims 23-26 depend from Claim 22.

Claim 34 directs to an apparatus for facilitating communications between other two wireless devices operating at two different bi-directional communication frequencies. This claim uniquely identified the following underlined feature that conventional techniques in the art failed to anticipate or render obvious:

… means for receiving signals on said at least two bi-directional communication frequencies ***simultaneously*** *…*

20. Claims 31 and 32 are allowed.

The following is an examiner's statement of reasons for allowance:

Claim 31 is directed to a method, implemented in a wireless communication device, of re-transmitting a detected signal. This claim uniquely identified the following underlined limitation that conventional techniques in the art failed to anticipate or render obvious:

> *… performing a splitting function on the signal by splitting the signal into a first and second signals, performing frequency conversion on each of the first and second signals based on a first intermediate frequency and a second intermediate frequency, respectively, and then splitting the frequency converted first and second signals…*

Claim 32 depends from claim 31.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

21. Applicant's arguments filed 6/19/2009 regarding Independent claims 1 and 18 and the Dependent claims therefrom have been fully considered but they are not persuasive.

Regarding claim 1, Applicant's arguments (Remarks pages 11-13) focused on "*a receiver capable of receiving signals on said at least two bi-directional communication frequencies simultaneously*" (emphasis added), asserting Atkinson "cannot disclose or suggest" (page 13 first paragraph) the cited feature hereinabove because Atkinson "simply indicates that the repeater can transmit and receive at the same time; not receive two communications on two different frequencies at the same time" (page 12 first paragraph).

Examiner respectfully disagrees. Firstly, while Applicant's argument directs to actually receiving two frequencies simultaneously, Claim 1 merely recites "capable of" such, which, as discussed in section 2 above, has been held not to constitute a limitation in any patentability sense or simply suggests or makes optional but does not require steps to be performed. Secondly, Atkinson, as discussed in section 9 above, is clearly "capable of" receiving two frequencies simultaneously even though it may process one at a time. Applicant is invited to review the detailed discussion thereof. Thirdly, even without considering the phrase "capable of", the Applicant's description provides no antecedent basis for the claimed *receiving signals on said at least two bi-directional communication frequencies simultaneously*"; all the Applicant's provided in the description is exactly what the Applicant used against Atkinson, i.e., "simply indicates that the repeater can transmit and receive at the same time; not receive two communications on two different frequencies at the same time", see analysis in section 1 above.

Regarding claim 18, Applicant provided no particular argument for this claim but merely stated that the feature argued for claim 1, as discussed above, is "similarly recited in independent claims 18, 34, 35" (Remarks page 13 first paragraph).

Examiner respectfully disagrees. As analyzed in section 7 above, Claim 18 is quite different from claim 1 because, while claim 1 claims receiving two frequencies simultaneously, claim 18 claims simultaneously receiving only "a signal" on two frequencies which by itself raised an indefiniteness issue as stated in section 7 above.

Even if we take that claim 18 meant to be the same or similar as claim 1 with respect to this feature, the discussion above for claim 1 applies to claim 18 as well.

22. Applicant's arguments, see Remarks page 13 first paragraph, filed 6/19/2009, with respect to Claim 34, have been fully considered and are persuasive. The art rejection of this claim has been withdrawn.

Regarding claim 34, Applicant provided no particular argument for this claim but merely stated that the feature argued for claim 1, as discussed in section 21 above, is "similarly recited in independent claims 18, 34, 35" (Remarks page 13 first paragraph). Examiner notes that Claim 34 does not have the "capable of" issue in claim 1 and, as indicated in section 21 above, would be allowable providing Applicant clears the objection issue raised in section 1 above.

23. Applicant's arguments filed 6/19/2009 regarding claim 35 have been fully considered but they are not persuasive.

Regarding claim 35, Applicant provided no particular argument for this claim but merely stated that the feature argued for claim 1, as discussed in section 21 above, is "similarly recited in independent claims 18, 34, 35" (Remarks page 13 first paragraph). Examiner notes that Claim 35 constitutes a non-statutory subject matter (101 rejected as stated in section 3 above) as well as a new matter (112 1st paragraph rejected as stated in section 5 above). Additionally, the functional feature similar to that of claim 1 discussed in section 21 above has the same issue for claim 1 and thus not persuasive.

24. Applicant's arguments filed 6/19/2009 regarding claim 33 have been fully considered but they are not persuasive.

Regarding claim 33, Applicant's argument (Remarks page 13) against Leslie is essentially the same as the argument for claim 1 against Atkinson discussed above. Since the counter argument in section 21 above applies to claim 33 herein, Applicant is referred to section 21 as well as discussion for claim 33 in art rejection in section 10 above to appreciate that the argument for claim 33 is not persuasive.

25. Applicant's arguments filed 6/19/2009 regarding claims 3, 6 and 19-20 (Remarks page 13), claims 2, 4, 5, 7 and 21 (Remarks pages 14-15) have been fully considered but they are not persuasive.

For these claims, Applicant's arguments are merely based on arguments made for Independent claims 1 and 18 and thus not persuasive, as discussed for claims 1 and 18 in section 21 above.

26. Applicant's arguments filed 6/19/2009 regarding claims 16 and 17 (Remarks page 15 have been fully considered but they are not persuasive.

Regarding claim 16, Applicant's argument against Atkinson regarding "*a receiver capable of simultaneously receiving a signal on either of said first and said second bi-directional communication frequencies*" is similar to that made for claim 1 as discussed in section 21 above and thus is not persuasive either on the same ground provided thereof. Additionally, Examiner points out Claim 16 has the same indefinite

issue as claim 18 discussed in section 18 as well and is thus further deemed not persuasive.

Regarding claim 17, Applicant's argument is purely based on arguments for claim 16 and thus is not persuasive.

27. Applicant's arguments, see Remarks pages 15-17, filed 6/19/2009, with respect to claims 22-26, have been fully considered and are persuasive. The art rejection of Claims 22-26 has been withdrawn.

Regarding claim 22, Examiner notes that Claim 22 does not have the "capable of" issue in claim 1 and, as indicated in section 21 above, and thus would be allowable providing Applicant clears the objection issue raised in section 1 above.

Regarding claims 23-26, Applicant's arguments are based on argument for claim 22 and thus are persuasive, and these claims would be allowable providing Applicant clears the objection issue raised in section 1 above for claim 22

28. Applicant's arguments filed on 6/19/09 regarding claim 27 have been fully considered but they are not persuasive.

Applicant's arguments in this regard (Remarks pages 17 – 20) are directed to two issues: 1) "visual indication of signal condition" (page 19) and 2) "signal level" (pages 19 – 20).

Regarding "visual indication of signal condition"

Applicant argues "Jacobson [secondary reference – Examiner notes] is directed to a control device that provides a visual indication of signal conditions on a selected control channel because a

human operator is required to manually change the channels" and "Leslie's [primary reference – Examiner notes] repeater is clearly automated and makes decisions on its one without a manual decision by a human operator. For this reason, adding a visual indicator to Leslie's repeater, as in Jacobson, appears to make little sense. In other words, in the normal operating scenario of Leslie's repeater, a human operator is not going to be present at each repeater location, so manual channel selection by human operators would not be used. Accordingly, this obviates the stated reason for why Jacobson includes a visual indication of channel quality."

Examiner respectfully disagrees. It is true that "in the normal operating scenario", a human operator is not going to be present at each repeater location, which applies to Applicant's repeater as well. However, it is also true that there are always abnormal operating scenarios, as well known to one skilled in the art, which also applies to Applicant's repeater as well, wherein communications via the repeater may fault or fail, that require human intervention for, for example, troubleshooting. Adding a visual indication provides a "first aid" for troubleshooting the abnormal scenarios, and by adding a particular visual indication disclosed by Jacobson based on signal condition "is relatively simple and economical in its configuration" (Jacobson, col. 2 lines 9-11) and thus will be a significant benefit to one skilled in the art.

Regarding "signal level"

Applicant argues "Even assuming Leslie was modified to output the signal strength of the IF signal, an output of signal strength by itself would not constitute 'a visual indication that indicates whether received signal levels from at least one of the station devices are sufficient for communication between at least one of the first and second wireless station devices and the wireless coverage extension device'. Even assuming that signal strength by itself is sufficient to determine signal presence (*e.g., which is not necessarily the case, because the measured signal strength could simply correspond to noise and not an*

actual signal), an indication of signal strength does not provide an indication of whether a signal level is sufficient for communication unless the operator is aware of a threshold signal strength level for a comparison" (emphasis original).

Examiner respectfully disagrees by simply pointing out that Applicant's claim 27 provided nothing specific about "signal levels". A "signal level", without further limitation (needless to say limitation that excludes noises), simply suggests, literally, a "signal level" which is not any different from "signal strength" because, in this context, the higher a signal level the stronger a signal strength and vice versa. Additionally, and as a matter of fact, throughout the whole Specification, while talking about "signal(s)" in numerous places as well as "signal strength" (page 2 paragraph [0004] second to the last line), the Applicant provided no definition or teaching about "signal level(s)" at all, much less about a signal level that excludes noises.

29. Applicant's arguments filed 6/19/2009 regarding claims 28-30 have been fully considered but they are not persuasive.

Regarding claim 28, Applicant's argument (Remarks page 20) against Leslie is essentially the same as that made for claim 33, which is not persuasive as discussed in section 24 above for claim 33.

Regarding claims 29 and 30, Applicant's argument (Remarks pages 20-21) for these claims are based on argument for claim 28 and thus are not persuasive as discussed hereinabove.

30. Applicant's arguments, see Remarks page 21, filed 6/19/2009, with respect to claims 31-32 have been fully considered and are persuasive. The art rejection of these claims has been withdrawn.

Regarding claims 31, Applicant amended the claim by incorporating into the claim previously indicated allowable subject matter in Office Action of 1/9/2008 for claim 8. Therefore, claim 31 is allowed, together with its dependent claim 32.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANDREW LAI whose telephone number is (571)272-9741. The examiner can normally be reached on M-F 7:30-5:00 EST, Off alternative Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang Yao can be reached on 571-272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Andrew Lai/
Examiner, Art Unit 2473